

REMARKS:

The title and claims have been amended to comply with the requirement of form in the Examiner's Action. It is believed that the claims are now in a better condition for appeal. Entry of such amendments is respectfully requested.

Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent 5,174,838 issued to Sandstrom in view of either of European Patent 410,311, European Patent 461,329 or Japanese Publication 1-135847. This rejection is respectfully traversed.

Applicants want to express their gratitude for the suggestions of the Examiner which are directed to the filing of a declaration under 37 CFR 1.132. Such a suggestion, however, is premised on the basis that U.S. Patent 5,174,838 discloses but does not claim the present invention. Once again, Applicants disagree with this premise.

Let's review the facts, accompanying an earlier response filed in the parent application (Serial No. 07/945,465 filed September 16, 1992) was the signed declaration of Paul Harry Sandstrom. This was the second of three declarations of Mr Sandstrom that have been filed. As stated in Mr Sandstrom's second declaration, he is the same Paul Sandstrom appearing as a named inventor on the primary reference. The rubber compound used in the tread base in his patent is comprised of at least one diene rubber and a high trans 1,4-polybutadiene rubber. The tread cap rubber compound is formulated to provide good skid resistance, tread wear and rolling resistance. The tread base rubber compound is formulated to enhance rolling resistance and durability of the tire. The primary purpose for dividing a tread into an outer cap portion and an underlying base portion is to provide a tread base which will reduce the tire's overall rolling resistance. As taught in Mr. Sandstrom's patent (column 1, lines 35-42), the cap/base rubber composite may be designed to improve the rolling resistance of the tire without unduly sacrificing its traction or tread wear. However, such a desirable aspect is difficult to obtain with a single tread compound because, for example, rolling resistance reduction is typically obtained at the expense of traction and/or tread wear. Therefore, this reference clearly teaches using a different rubber compound in the tread cap and in the tread base.

It has been recognized in a previous Examiner's Action that Sandstrom '838 does not teach the rubber composition containing trans 1,4-polybutadiene should be used in the apex region. However, the Examiner has relied on the secondary references cited above as disclosing use of rubber compositions suitable for the bead and/or apex region of the tire as well as the tread. The conclusion of the Examiner's Action is that it would have been obvious of one of ordinary skill in the art at the time of the invention to use the composition of Sandstrom '838 in the bead area since it is known that compositions disclosed for use in the tread area of the tire are suitable for use in the tire apex. This contention is respectfully traversed.

Mr Sandstrom comments on the teachings of the Abstract to EP 410311 in his second declaration at paragraph 4. This abstract teaches the use of a rubber compound of which 30 to 100 percent of the rubber consists of a hydrocarbon rubber containing nitrile groups. The Abstract discloses that the specific rubber compound may be used in at least the tread, sidewall, profile core and bead. The profiled core (7) is the apex of the tire. The Abstract goes on to teach that the bead and/or outer cores are preferably free from phenolic resin. This implies to Mr. Sandstrom that phenolic resins may be used in the tread and, therefore, the rubber compound from the tread is not identical to the rubber compound used in the apex aside from the common usage of the 30 percent to 100 percent of the hydrocarbon containing nitrile groups. Simply because one reference says a particular rubber compound may be used in an apex of a tire and in a tread does not mean that all compounds for use in a tread are acceptable for use in an apex of a tire. Not all compounds for use in a tread are equivalent. In addition, there is no teaching in this reference that hydrocarbon rubber containing nitrile groups may be a replacement for 1,4-polybutadiene rubber or that it is equivalent in terms of properties. Another point of intent is that Sandstrom '838 teaches the importance of a two-component tread (base and cap) coupled with the trans-polybutadiene in the base. The abstract for EP 410311 does not make such a distinction and, therefore, would imply the use of the rubber with nitrile groups in the cap compound (ground contacting) since not all tires have two component treads. The wrongful assumption on the part of the Examiner is EP 410311 suggests the equivalence of a tread base compound and a compound for use in an apex.

During Mr. Sandstrom's 25 years of experience in the field of polymer science, he has learned that there are hundreds of recipes for rubber compounds, each of which are typically tailored to their end use in a tire. The pneumatic tire is a complex system of interacting components, each with its own properties for maximum effectiveness; yet, the performance of the tire depends on the interactions of the components. The reason for this is because each component of the tire has its own performance requirements which must be considered when formulating the rubber compound for use in the respective component. For example, when one is formulating a rubber compound for use in a tread cap, one looks for properties that include high elongation and high tear strength so the tire tread has higher rolling resistance and maximum cut growth resistance. When one is formulating a rubber compound for use in an apex, one looks for properties that include high stiffness and high modulus because the tire designer does not want the apex area to move to avoid delamination of the tire from the rim during use. Rubber compounds with high stiffness and high modulus would necessarily have low tear strength and low elongation values. Rubber compounds for tread caps would have high tear and high elongation values.

The other secondary reference that is cited in the Examiner's Action is EP 461329. EP 461329 discloses the use of reinforced polymer blends containing micro and macrofibers in various tire components. The polymer blends are described as being useful in the tread base, tread, apex, sidewall and bead areas of tires. The reinforced polymer blends contain a base polymer, such as polyisoprene, SBR, polybutadiene, NBR, polychloroprene, natural rubber and EPDM. To this base polymer, one mixes a macro fiber of a polyamide, polyester, polyolefin, cellulosic fiber, polyamide, polyurea, polyurethane and polybenzamide azote. Examples of micro fibers include polyamide, polyesters, polyurethanes and mixtures thereof. Trans polybutadiene is not taught. More specifically, this reference does not disclose or suggest the use of an apex composition comprised of, based on 100 parts by weight of rubber, (a) about 80 to 97 parts by weight of at least one rubber selected from the group consisting natural rubber, synthetic cis-1,4-polyisoprene rubber and cis 1,4-polybutadiene rubber and (b) 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber having from 75 to about 84 percent by weight trans 1,4-content. The claimed invention in the present application is not the first pneumatic tire with an apex compound. Hundreds of compounds have been tested for use

in an apex. However, two essential points need to be made. First, a specific tread base compound is not viewed by one skilled in the art as a drop in the slot replacement for an apex compound. At best, the prior shows certain inventions (operating with their ranges) may be adjusted for different applications. Second, the reinforced compounds of EP 461329 are not taught as being equivalent nor are they in the mind of Mr Sandstrom, to the compounds used in his patent 5,174,838.

The Abstract to Japanese publication 1,135,847 has also been cited by the Examiner to supplement the noted deficiencies of Sandstrom '838. This abstract discloses a tire containing a butadiene polymer having 70 to 90 percent of trans 1,4-bonds. The polymer may be used for tread, sidewall, belt and bead applications. This abstract does not disclose the use of trans 1,4-polybutadiene in an apex wherein the uncured state of the polybutadiene has two melting points. The abstract also does not suggest that a tread compound may be substituted for an apex compound.

Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. as being unpatentable over U.S. Patent 4,824,899 issued to Yasuda in view of U.S. Patent 5,174,838 issued to Sandstrom et al. This rejection is respectfully traversed.

U.S. Patent 4,824,899 issued to Yasuda teaches the use of 1 to 15 parts by weight of a metal salt of acrylic acid. The present invention requires from about 3 to about 20 parts by weight of a trans 1,4-polybutadiene rubber. Yasuda does not suggest or disclose nor is Mr. Sandstrom aware of any reference that would suggest or disclose that trans 1,4-polybutadiene is equivalent to or is a known replacement for a metal salt of acrylic acid in a rubber for use in any tire. It is contended that the combination in Yasuda results in a composition substantially similar in properties to the composition of Sandstrom et al. This is not shown in the reference and Applicants respectfully repeat their request for a declaration or affidavit from the Examiner to support the Examiner's position that the compositions of Yasuda are substantially similar to those of Sandstrom et al. Simply because one combines a rubber with a certain additive to improve a certain property does not necessarily demonstrate that the resulting compositions have the same properties overall. While it is a given that certain components of a tire require specific minimum properties to function, it is wrong to believe that merely reproducing such properties of the prior art anticipates or renders obvious all future compounds with the same properties. Applicants are not claiming properties but rather a pneumatic tire.

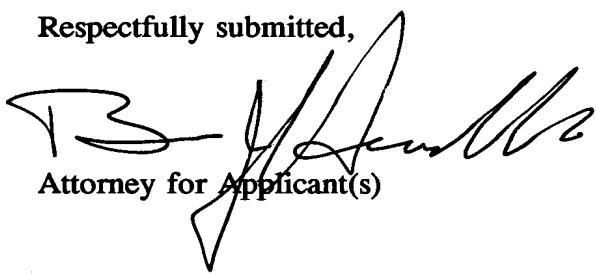
Claims 1-2, 4-6 and 8-14 have been rejected under 35 U.S.C. §103 as being unpatentable over the Abstract for Japanese publication 57-212239 in view of U.S. Patent 5,174,838 issued to Sandstrom et al. This rejection is respectfully traversed. The Abstract to the Japanese publication teaches a rubber composition for a bead filler which is comprised of (a) 100 parts by weight of rubber composed of (1) 70 to 95 parts of a solid rubber selected from natural rubber, polyisoprene rubber, polybutadiene rubber and styrene-butadiene rubber and (2) 30 to 5 parts of a liquid diene rubber having functional groups at the molecular terminals or in the molecule with (B) a masked polyisocyanate and (D) 5 to 25 parts by weight of a Novolak-type phenolic resin and/or a Novolak-type modified phenolic resin. The Examiner has cited page 2, lower left hand of the text, lines 11-20 as teaching the use of polybutadiene. Once again, Applicants have not been provided with a translation of this reference other than the English translation of the Abstract. Applicants would appreciate if such a copy would be provided if the Examiner continues to maintain the rejection of any claims based upon English passages of this reference other than those passages found in the Abstract. Is the Examiner suggesting the cited passage is more relevant than the Abstract? The teaching of a diene type rubber such as polybutadiene is generally meant to include cis 1,4-polybutadiene rubber. Cis 1,4-polybutadiene rubber and trans 1,4-polybutadiene are drastically different rubbers. This reference also fails to suggest or disclose that the liquid diene rubber having functional groups at the molecular terminals or in the molecule coupled with the use of a masked polyisocyanate is equivalent to or may be a drop in slot replacement for trans 1,4-polybutadiene. It is stated in the Examiner's Action that Sandstrom et al teach that trans 1,4-polybutadiene is well known for improving green strength of rubber mixtures and, thus, would be well suited for use in the bead filler of the Japanese publication. Is such a suggestion in the mind of the Examiner or founded in the cited art. Applicants submit the latter is not the case at hand. Applicant's review of the Abstract indicates nothing is said about improving green strength. It is only the Examiner's opinion that suggests the combination and not the references themselves. It was stated in the Examiner's Action that it would have been obvious to one of ordinary skill in the art at the time of the invention to use the trans 1,4-polybutadiene of Sandstrom et al as the liquid diene rubber required by the Japanese publication 57-212239. Once again, Applicants respectfully request where such equivalence is taught in the references. Applicants contend that such

a showing is not taught, disclosed or would be suggested to one of ordinary skill in the art. It is also stated in the Examiner's Action that such a combination of references results in a composition essentially similar to that of Applicants. Once again, the Examiner has simply looked at one property that is allegedly improved and concluded that all of the properties would be similar. This conclusion is not supported in the cited references standing alone or in combination.

Applicants have reviewed the references cited as of interest but submit that fail to supplement the above-noted deficiencies of the cited references.

Based upon the foregoing, Applicants respectfully request entry of the present amendment and reconsideration of the rejection.

Respectfully submitted,

A handwritten signature consisting of the initials 'B.J.' followed by a stylized surname.

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